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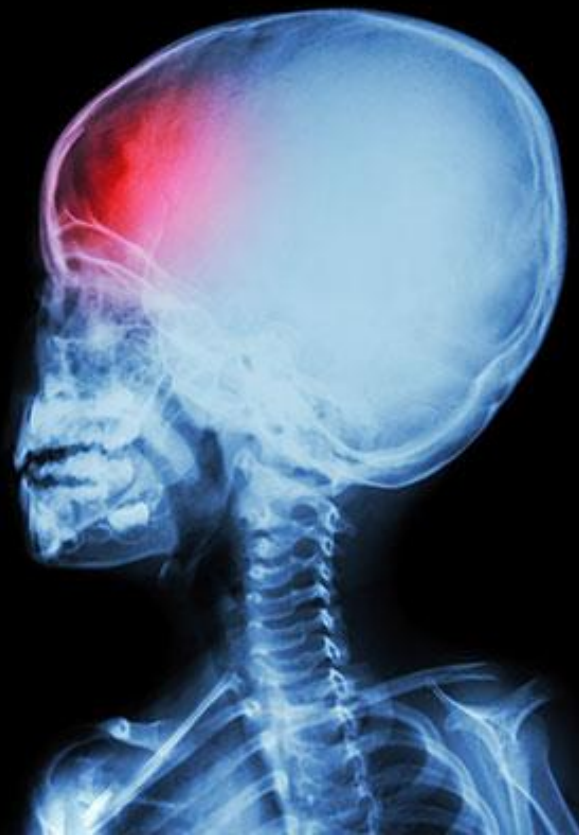
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Pediatric Abusive Head Trauma: A Brief Overview

By Jerrod Brown, Kelsie Kuyath, Michael Eberlein, Brandie Hardcastle, and Janina Cich

According to the Centers for Disease Control and Prevention (2012), Pediatric Abusive Head Trauma (PAHT) is the third-leading cause of head injury in children and the leading cause of serious head injury in the first year of life in the United States. Medical literature continues to recognize and describe the differences in the biomechanics of head injury regarding intentional versus unintentional pediatric head trauma. The aim of this article is two-fold: (1) to present five essential facts about PAHT that all professionals should know, and (2) to encourage professionals to seek out training and consultation related to this complex area of study.

1. PAHT Risk Factors

- a. Risk factors for PAHT victims: Although PAHT affects infants from all backgrounds, there are a couple of key risk factors that impact a PAHT diagnosis. First, the likelihood of PAHT occurring is partially dependent upon the size and age of the child. For example, the appropriate muscle tone in the neck is not sufficiently developed to withstand rapid head movement in infancy (Lopes, Eisenstein, & Williams, 2013; Oral, Rahhal, Elshershari, & Menezes, 2006). Thus, physical abuse is the cause of most serious head injuries for infants under the age of 1 (Alexander, Levitt, & Smith, 2001; Agran et al., 2003). Infants are in the earliest stage of physiological and brain development, and thus more susceptible to head injuries. Second, abuse may be more prevalent among younger victims. Specifically, the highest rate of physical abuse is typically found in infants 4 to 6 months of age (Frasier, 2008; Leventhal, Martin, & Asnes, 2010), with the incident rate of abuse

tending to decrease as children get older (Keenan et al., 2003; Eisele et al., 2006). The first few months of infancy are when episodes of prolonged, inconsolable, and unpredictable crying are developmentally normal. Although normal, infant crying is a common trigger that leads to PAHT (Catherine, Ko, & Barr, 2008; Barr et al., 2009). Nevertheless, injuries consistent with abusive head trauma have been found in children as old as 5 years of age (American Academy of Pediatrics, 2001). Third, male children are more likely than female children to be victims of PAHT (Adamsbaum et al., 2010).

- b. Risk factors for PAHT perpetrators: Although risk factors for PAHT perpetrators are complex, Christian & Block (2009) reported that male caregivers are most often identified as the perpetrators of abuse, especially if the male had no relation to the child — as in the cases of stepfathers and mothers' boyfriends (Schnitzer & Ewigman, 2005; Starling et al., 2007). A history or current symptoms of depression, anxiety, and/or substance abuse placed both male and female caregivers at a higher risk of becoming perpetrators (Covington, Foster, & Rich, 2005). Altimeir (2008) identified additional perpetration risk factors including: young age (adolescent caregivers are implicated), feelings of isolation or inadequacy, poor impulse control, rigid behaviors, low socioeconomic status, and negative childhood experiences. Other factors include increased stress, lack of knowledge, or irrational assumptions about infants (Thomson & Primiani, 2006).

2. Mechanism of Injury

PAHT is defined as an inflicted injury to the head and its contents, including those injuries caused by shaking and blunt-force impact (CDC, 2012). Infants are particularly vulnerable to head injuries caused by shaking actions due to the combination of a disproportionately large head, soft and rapidly growing brain tissue, thin skull wall, and lack of head and neck control. The most severe injuries often occur when a child's head is impacted by a hard surface along with violent shaking (Levin, 2010; Riazi, 2012), which subjects an infant's head to acceleration and deceleration as well as rotational forces (Levin, 2010). This type of motion is especially damaging to young infants because a newborn's head is approximately 10-15% of its body weight, whereas an adult's head is typically only 2-3% of body weight (NCSBS, n.d.).

3. Medical Presentation

Children with abusive head trauma can present with a variety of symptoms. A PAHT diagnosis typically includes subdural hematomas, retinal bleeding, fractures, cerebral edema, and rib or long bone fractures (Bandak, 2005; Frasier, 2008; Gerber & Coffman, 2007; Adamsbaum et al., 2010). PAHT is difficult for physicians to diagnose because victims often lack external signs of abuse, such as bruising, and caregivers often provide no explanation for head injuries. In other words, while physical damage may be apparent, a diagnosis of PAHT also requires a description of the means by which the injury was incurred, which is harder to prove. Further, mild or nonspecific symptoms may include loss of appetite, irritability, and vomiting, which are frequently symptoms of other illnesses (Lazear, 2009). Other possible symptoms are a loss of consciousness and seizures (Hobbs et al., 2005) as well as psychiatric concerns, increased fears and withdrawal, and learning challenges (Kapapa et al., 2010). This range of symptoms may be

associated with a variety of factors, such as the child's age and size, the mechanism of the injury, the amount of force used, the amount of time that has lapsed since the injury, or the number of times the child has been injured or abused.

4. **Morbidity and Mortality**

There are high rates of mortality and morbidity for PAHT. Mortality rates are between 25-30% for hospitalized babies who are suspected of having PAHT (Barr, 2012; Ashton, 2010). Approximately 80% of surviving children have neurological impairments, including persistent deficits in attention, arousal, emotional regulation, and motor coordination (CDC, 2012; Frasier, 2008; Ashton, 2010).

5. **Prevention**

Exposure to effective PAHT prevention information and knowledge of community resources could save both lives and the expenses of caring for PAHT victims. Hospital-based programs targeting parents of newborn infants could significantly reduce the incidence of abusive head injuries among young infants (Lazear, 2009). For example, Ronald G. Barr and Marilyn Barr developed and tested prevention materials referred to as the Period of PURPLE Crying. Use of this hospital-based program appears to lead to higher scores in awareness about early infant crying and the hazards of shaking, and to sharing of information considered to be vital for the deterrence of shaking. Another key component to prevention is ensuring that at-risk parents receive the support they need. This support could be found in a number of ways including respite care for overwhelmed parents, support groups, routine medical checkups where doctors talk to parents about appropriate infant behavior and how parents handle it, and parenting classes for parents of children of all ages (CPS, Mother's First/Project Child).

Biographies

Jerrod Brown, M.A., M.S., M.S., M.S., is the Treatment Director for Pathways Counseling Center, Inc. Pathways provides programs and services benefitting individuals impacted by mental illness and addictions. Jerrod is also the founder and CEO of the American Institute for the Advancement of Forensic Studies (AIAFS), and the lead developer and program director of an online graduate degree program in Forensic Mental Health from Concordia University, St. Paul, Minnesota. Jerrod is currently pursuing his doctoral degree in psychology.

Kelsie Kuyath received her Bachelor of Business Administration degree from the University of Wisconsin-River Falls. She works for Mayo Clinic Health System in Red Wing, and is the Founder and Board Chair of One Shake Is All It Takes, a nonprofit organization in Minnesota that is dedicated to preventing Pediatric Abusive Head Trauma through awareness, education, and family support.

Michael Eberlein is a peace officer for the city of West St. Paul. He has been a law enforcement officer for 10 years and an investigator for the last five. He is also a Board Member for the Minnesota Sex Crimes Investigators Association. Michael obtained a Bachelor of Mechanical Engineering from the University of Minnesota in 2000 and an Associate Degree in Law Enforcement from Alexandria Technical College in 2005.

Brandie Hardcastle, M.A., LADC, LPCC, is the Clinical Director of Elite Recovery, an outpatient treatment program for men and women who are addressing substance use and mental health issues. Brandie specializes in individual and group therapy for adults with substance use, behavioral addictions, and mental health issues. She believes in meeting clients where they are in life and helping them and their support systems to set achievable goals in order to enhance quality of life.

Janina (Wresh) Cich, M.A., has two decades of criminal justice experience. She is a retired Law Enforcement Officer, Domestic Abuse Response Specialist, Crisis Intervention Specialist, Crime Scene Technician, and Emergency Medical Technician (EMT). She is an adjunct instructor and lecturer, COO of the American Institute for the Advancement of Forensic Studies, Board Member of the Midwest Alliance on Shaken Baby Syndrome (MASBS), and co-author of multiple forensic mental health articles.